(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 196 288**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **14.11.90**

(51) Int. Cl.[5]: **B 65 D 1/32**

(21) Application number: **86850097.6**

(22) Date of filing: **19.03.86**

(54) **Dosage package.**

(30) Priority: **29.03.85 SE 8501582**

(43) Date of publication of application:
01.10.86 Bulletin 86/40

(45) Publication of the grant of the patent:
14.11.90 Bulletin 90/46

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(56) References cited:
EP-A-0 061 522
FR-A- 789 959
FR-A-2 187 617
FR-A-2 231 571
GB-A-2 079 238

(73) Proprietor: **Aktiebolaget Draco**
Box 34
S-221 00 Lund (SE)

(72) Inventor: **Widerström, Carin Ann-Helén Marianne**
Höllviksstrandsvägen 77B
S-236 00 Höllviken (SE)

(74) Representative: **Hjertman, Ivan T. et al**
AB ASTRA Patent and Trade Mark Department
S-151 85 Södertälje (SE)

EP 0 196 288 B1

Courier Press, Leamington Spa, England.

Description

The invention relates to a dosage package for storing and/or dosed discharge of a liquid, semi-liquid or pasty product, e.g. a medicament, foodstuff, cosmetic or an additive, which is to be added in a well defined amount.

The dosage package comprises a container of a thermoplastic material, which container is dimensioned and shaped for discharge of a specific dosage via a discharge portion by squeezing the container.

Dosage packages are known e.g. from US-A-3,993,223, wherein a container which is elongated and tubular with a flattened cylindrical middle portion, is described. The package is substantially elliptical in cross-section and connected at the top to a truncated conical portion (having a discharge opening) and at the bottom to a hemispherical end portion. A planar holding tab is connected to the end portion, which tab in co-operation with a tab on a break off sealing portion facilitates the opening of the container.

In this known dosage package discharge is achieved by manual squeezing of the middle portion of the container, whereby the whole container is being deformed. By compressive forces of different strength the desired dosage can be discharged, and the remaining liquid quantity can be read on a scale on the container. Thus, the container construction as such will not discharge a well defined dosage, but the quantity discharged can be completely mastered by the user by adjustment of the compressive force.

DE-A1-3118580 describes a dosage package for an ointment or other similar product. Usually the package contains one dosage of the ointment. By compressing the whole package all the contents are squeezed out. Also DK-C-103686 describes a dosage package which is squeezed together at use. The dosage packages described in the two last mentioned documents will only discharge a well defined dosage when all the contents of the package are squeezed out. It is not possible to discharge a specific dosage by squeezing the container once. Furthermore none of the dosage packages has the special form of the walls claimed in this application. The specific form of the walls of the claimed dosage package makes squeezing possible despite the great wall thickness.

Also known in the art (FR-A-2 231 571) is a device made of thermoplastic material for dispensing liquid products such as soap and detergents. The rear side of the device is essentially flat and adapted for fixation at a wall or other flat surface whereas its front side is provided with a recess similar in form to a spherical cap. Pressing the elastic spherical cap increases the pressure in the device and makes the liquid rise in a narrow tube drawn thorough the top of the container whereby the liquid is dispensed. When the manually exerted pressure recedes the liquid retracts, and thus stops dispensing.

One object of the invention is thus that squeezing can be performed conveniently despite the relatively great wall thickness of the container, so that the dosage package can also be used for products demanding high diffusion tightness and accordingly relatively thick container walls.

Another object is to achieve a dosage package, which be the construction of the container ensures a well-defined dosage.

Yet another object is to achieve a dosage package, the form of which facilitates the opening of the container by breaking off a sealing part as well as a dosed discharge by squeezing.

These objects are achieved in a dosage package according to the invention in that the container is relatively flat with an all around extending and rigid edge wall portion, to which the discharge portion is joined, as well as two opposite side wall portions at least one of which comprises an outwardly curved portion, which is compressible in order to discharge a well defined dosage. Thus, the edge wall portions and discharge portions of the container will retain their geometrical shape when squeezed, and merely the curved portion of the respective side wall portions will be deformed. By this the decrease in volume caused by the compression gives a dosage quantity which is well defined. The curved portion, when compressed, will pass an intermediate position having a complicated, wavy shape and then be bent inwards to an inwardly curved shape, approximately corresponding to the outwardly curved original position, while the other container portions remain intact. The curvature of the curved portion, however, should not be too great, as the deformation then is rendered more difficult through the shell effect.

Preferably the container is substantially symmetrical relative to a central place beteeen the opposite side wall portions, which thus each has an outwardly curved portion. A holding tab on a break off sealing part can be oriented in parallel to said central plane. The latter arrangement brings about that the container can be opened in a very convenient manner, the flat container being held in one hand and the holding tab in the other and is twisted in order to break off the sealing part from the discharge portion.

Specifically, according to the invention, there is provided a dosage package for a liquid, semi-liquid or pasty product comprising a container (1) of a thermoplastic material, said container being adapted to the discharge of one or several doses of said product via a discharge portion (2), said container having a closed circumferentially extending edge wall portion (5) to which said discharge portion (2) is joined, and having two opposite side wall portions (8, 9) one of which comprises a membrane member (8b, 9b) which is compressible in order to discharge said doses, said container (1) further having substantially the same wall thickness both in said edge wall portion (5) and said side wall portions (8, 9) and said edge wall portion (5) and side wall portions (8, 9) being connected by a rounded portion (6, 7) which continues into an annular portion (8a, 9a)

to which said membrane member (8b, 9b) is joined, characterised in that said membrane member consists of an outwardly curved elastically deformable portion forming part of at least one of said side wall portions, in that said side wall portion is rigid and in that a definite volume of said product is discharged by compression of the membrane member(s) into an inwardly curved position without deforming other portions of the container.

Further preferred features and advantages of the invention appear from the subclaims 2 — 6 and from the detailed description below.

Thus, the invention is to be explained more in detail below, reference being made to the attached drawing, which illustrates a preferred embodiment of the dosage package according to the invention.

Fig. 1 is a top view of a dosage package according to the invention:

Fig. 2. is a side view of the dosage package of Fig. 1; and

Fig. 3 is a central longitudinal section along the line III-III of Fig. 1.

The dosage package shown on the drawing substantially consists of a relatively flat container 1 having a conical tubular discharge portion 2, the outer end of which is sealed by means of a break off sealing part 3 provided with a plane holding tab 4.

The container is symmetrical in relation to two longitudinal planes, that is central planes parallel to each drawing plane, in Fig. 1 and 2, respectively, and is in this example manufactured according to the so-called bottlepack technique (see e.g. US 3,325,860). The container is moulded in two tool halves. The central plane C in Fig. 3 is located between these halves. According to the example described the container contains an inhalation liquid for treatment of pulmonary diseases. The active substances in these preparations are often sensitive to oxidation and it is therefore important to decrease the penetration of oxygen gas through the container wall from the outside by diffusion. It is also important that the contents of the container do not diffuse out, as this will result in a change in the concentration.

Glass should have been a suitable material, as being practically diffusion tight, but plastic is preferred partly because it can be broken off without leaving any sharp, hard portions which may cause cuts, partly because it is deformable to a considerable extent, whereby discharge by squeezing is made possible. However, for the plastic materials being eligible, namely polyethylene, polypropylene or polyester, which do not react with the product, the thickness of the material must be relatively great in order to decrease the diffusion of oxygen gas to the inside of the container and loss of liquid through the container wall. Thus, in the present case, the wall thickness must be approximately 0.8 mm in order to achieve a satisfactory tightness of the package.

With such a great wall thickness and attending stiffness of the walls, the container must be formed in a specific way in order to make possible a convenient squeezing for a dosed discharge of the contents. For example the container of US-A-3,993,223 mentioned in the beginning would hardly be able to be squeezed if having a wall thickness as great as 0.8 mm.

In one embodiment of the invention the container 1 is relatively flat, i.e. the vertical extension (distance h = 14 mm in Fig. 2) is considerably less than the width (b = 28 mm, Fig. 1) and the length (l = 49 mm, Fig. 1). The container has an all around, along a circular outline, extending edge wall portion 5, which is circularly cylindrical and via an intermediate portion having a small radius of curvature 6 and 7, respectively, continues into an upper side wall portion 8 and an opposite, lower side wall portion 9, respectively. The upper side wall portion 8 comprises a substantially plane or outwardly bulged annular portion 8a (Fig. 3) as well as a central, relatively great, outwardly (upwardly) slightly curved portion 8b, and in a corresponding way the lower side wall portion 9 comprises an annular portion 9a and an outwardly (downwardly) curved portion 9b.

While the circularly cylindrical edge wall portion 5 and the thereto connected truncated conical discharge portion 2 are extremely shape permanent as a consequence of their geometrical configuration, the slightly curved portions 8b and 9b can easily be deformed by squeezing by means of two or more fingers (the thumb on one side and e.g. the fore finger on the opposite side). Each respective portion 8b, 9b will then pass a wavy central position (the shorter dashed-dotted line in Fig. 3) and finally be transformed into a completely depressed, inwardly curved final position (the longer dashed-dotted line in Fig. 3). By this the container volume is decreased with a well defined volume part corresponding to the desired dosage. If desired, the container can contain a volume of the product referred to being sufficient for two or more dosages. By squeezing the opposite curved portions 8b, 9b once a well defined dosage is thus obtained (after the breaking off of the sealing part 3).

In the example shown the container volume is about 5 ml. The wanted dosage is 2 ml, which is obtained when the opposite curved portions are completely compressed (which does not require a particularly great force). The container can be filled with 2 ml, i.e. corresponding to one dosage, or 4 ml, i.e. corresponding to two dosages.

It is apparent from the cross-section according to Fig. 3 that the container has mainly the same wall thickness (about 0.8 mm) all over. In the transitional zone 10 between the discharge portion 2 and the sealing part 3 the wall thickness is reduced, implying a weakening, which is used when breaking off the sealing part 3. The latter can be particularly conveniently performed in holding the flat container 1 in one hand, while the holding tab 4 is held in the other hand and a twisting motion is made until the material breaks while being sheared in the transitional zone 10.

It is further apparent from Fig. 1 that a flange 11

is formed in one piece with the container 1. The flange 11 is plane and is located in the central plane C (in Fig. 3) and has a polygonal, in the shown example, hexagonal outline. The flange 11 renders a certain stiffness to the edge wall portion 5, but its main purpose is to enable a joining of several packages of the same kind in connection with the manufacturing. As is previously known the different containers are oriented next to each other with the opposite flange edges 11a and 11b connected to the corresponding flange edges of the adjacent containers via weak material bridges. The opposite edges 4a and 4b of the holding tabs 4 are also connected to the holding tabs of the adjacent containers.

The package can be modified in various ways by a person skilled in the art within the scope of claim 1. In principal only one side wall 8 or 9 can have an outwardly curved portion, while the other is substantially plane and relatively shape permanent. Furthermore, the edge wall portion of the container can have a polygonal outline and the curved portion 8b and 9b, respectively, can also have a non-circular periphery, e.g. elliptical or polygonal. The curved portion can be either single curved or double curved. However, the curvature must not be so great that the deformation when squeezing is made more difficult. Furthermore, the container can be designed without a flange. Other methods than the bottle-pack can in addition be used for the forming of the container. The container is for example manufactured by conventional injection moulding, whereafter the filling of the product takes place separately and is followed by a sealing of the container.

Finally, the container can have lesser or greater dimensions than in the example shown and can, e.g., hold several dosages. The extent of filling can vary and also other products than medicaments of different kinds, for example foodstuff, cosmetics, skin care articles, setting agents for resins, additives for laboratory use, and so on, can be packed in this way.

Claims

1. Dosage package for a liquid, semi-liquid or pasty product comprising a container (1) of a thermoplastic material, said container being adapted to the discharge of one or several doses of said product via a discharge portion (2), said container having a closed circumferentially extending edge wall portion (5) to which said discharge portion (2) is joined, and having two opposite side wall portions (8, 9), one of which comprises a membrane member (8b, 9b) which is compressible in order to discharge said doses, said container (1) further having substantially the same wall thickness both in said edge wall portion (5) and said side wall portions (8, 9) being connected by a rounded portion (6, 7) which continues into an annular portion (8a, 9a) to which said membrane member (8b, 9b) is joined, characterised in that said membrane member consists of an outwardly curved elastically deformable portion forming part of at least one of said side wall portions, in that said edge wall portion is rigid and in that a definite volume of said product is discharged by compression of the membrane member(s) into an inwardly curved position without deforming other portions of the container.

2. Dosage package according to claim 1, characterized in that the container is substantially symmetrical relative to a central plane (C) between the opposite side wall portions (8, 9).

3. Dosage package according to claims 1 or 2, characterized in that a break-off sealing part (3) is provided with a holding tab (4) being parallel to said central plane (C).

4. Dosage package according to any of claims 1—3, characterized in that said curved portion (8b, 9b) has the shape of a cap.

5. Dosage package according to any of the preceding claims, characterized in that said edge wall portion (5) is substantially cylindrical.

6. Dosage package according to any of the preceding claims, characterised in that the container consists of polyethylene, polypropylene or polyester and has a wall thickness of 0.3 — 1.5 mm, preferably 0.6 — 1.0 mm, in particular 0.8 mm.

Patentansprüche

1. Dosierungspackung für ein flüssiges, halbflüssiges oder pastenartiges Produkt umfassend einen Behälter (1) aus thermoplastischem Material, welcher Behälter zur Abgabe einer oder mehrerer Dosen des Produktes über einen Abgabeteil (2) beschaffen ist, wobei der Behälter einen geschlossenen, in Umfangsrichtung verlaufenden Randwandteil (5) aufweist, mit dem der Abgabeteil (2) verbunden ist, und zwei gegenüberliegende Seitenwandteile (8, 9) hat, von welchern einer ein Membranelement (8b, 9b) umfaßt, das zur Dosisabgabe zusammendrückbar ist, welcher Behälter (1) weiters sowohl im Randwandteil (5) als auch in den Seitenwandteilen (8, 9) im wesentlichen dieselbe Wandstärke aufweist, welche Seitenwandteile durch einen abgerundeten Teil (6, 7) verbunden sind, der sich in einen ringförmigen Teil (8a, 9a) fortsetzt, mit dem das Membranelement (8b, 9b) verbunden ist, dadurch gekennzeichnet, daß das Membranelement aus einem nach außen gekrümmten elastisch verformbaren Teil besteht, der einen Teil zumindest eines dieser Seitenwandteile bildet, daß der Randwandteil starr ist und daß ein bestimmtes Volumen des Produktes durch Zusammendrücken des Membranelementes (der Membranelemente) in eine nach innen gekrümmte Position ohne Verformung anderer Teile des Behälters abgegeben wird.

2. Dosierungspackung nach Anspruch 1, dadurch gekennzeichnet, daß der Behälter in bezug auf eine Mittelebene (C) zwischen den gegenüberliegenden Seitenwandteilen (8, 9) im wesentlichen symmetrisch ist.

3. Dosierungspackung nach den Ansprüchen 1 oder 2, dadurch gekennzeichnet, daß ein Abbrech-Verschlußteil (3) mit einer Haltelasche (4) versehen ist, die sich parallel zur Mittelebene (C) erstreckt.

4. Dosierungspackung nach einem der Ansprüche 1-3, dadurch gekennzeichnet, daß der gekrümmte Teil (8b, 9b) die Form einer Kappe hat.

5. Dosierungspackung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Randwandteil (5) im wesentlichen zylindrisch ist.

6. Dosierungspackung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Behälter aus Polyäthylen, Polypropylen oder Polyester besteht und eine Wandstärke von 0,3 — 1,5 mm, vorzugsweise 0,6 — 1,0 mm, insbesondere 0,8 mm, aufweist.

Revendications

1. Emballage de dosage pour un produit liquide, semi-liquide ou pâteux comprenant un récipient (1) de matériau thermoplastique, ledit récipient étant adapté à décharger une ou plusieurs doses dudit produit par une partie de décharge (2), ledit récipient ayant une paroi formant rebord fermée s'étendant circonférentiellement (5) à laquelle est réunie ladite paroi de décharge (2), et ayant deux parois latérales opposées (8, 9), dont une comporte un élément de membrane (8b, 9b) qui peut être comprimée afin de décharger lesdites doses, ledit récipient (1) ayant en outre à peu près la même épaisseur de paroi, ladite paroi formant rebord (5) et lesdites parois latérales (8, 9) étant reliées à la fois par une partie arrondie (6, 7) qui continue dans une partie annulaire (8a, 9a) à laquelle est réunie ledit élément de membrane (8b, 9b), caractérisé en ce que ledit élément de membrane est constitué d'une parie élastiquement déformable incurvée vers l'extérieur faisant partie d'au moins une desdites parois latérales, et en ce que ladite paroi de rebord est rigide et en ce que un volume défini dudit produit est déchargé par compression de(s) élément(s) de membrane en une position incurvée sans déformer les autres parties du récipient.

2. Emballage de dosage selon la revendication 1, caractérisé en ce que le récipient est sensiblement symétrique par rapport à un plan central (C) entre les parois latérales opposées (8, 9).

3. Emballage de dosage selon la revendication 1 ou 2, caractérisé en ce que une partie d'étanchéité à rompre (3) est ménagée, une patte de maintien (4) étant parallèle audit plan central (C).

4. Emballage de dosage selon l'une quelconque des revendications 1 — 3, caractérisé en ce que ladite partie incurvée (8b, 9b) a la forme d'un capuchon.

5. Emballage de dosage selon l'une quelconque des revendications précédentes, caractérisé en ce que ladite paroi formant rebord (5) est à peu près cylindrique.

6. Emballage de dosage selon l'une quelconque des revendications précédentes, caractérisé en ce que le récipient est constitué de polyéthylène, polypropylène pu polyester et a une épaisseur de paroi de 0,3 — 1,5 mm, et de préférence de 0,6 — 1,0 mm, en particulier de 0,8 mm.

FIG. 1

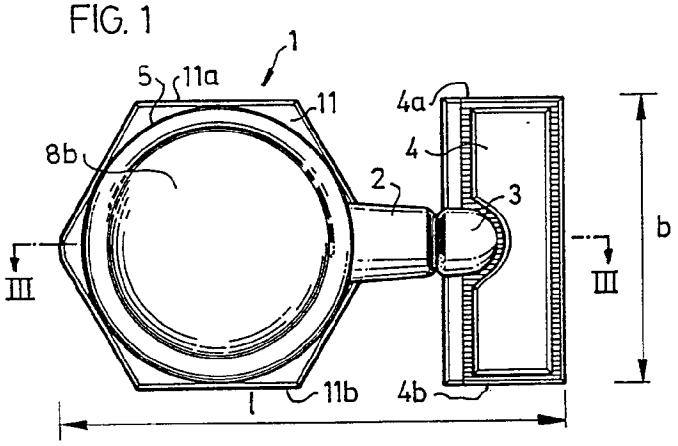

FIG. 2

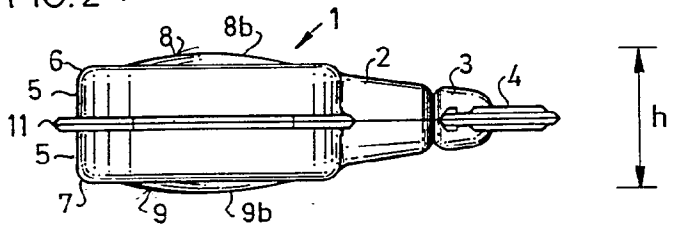

FIG. 3